

WOOD ANATOMY OF THE NEOTROPICAL SAPOTACEAE XXXVIII  
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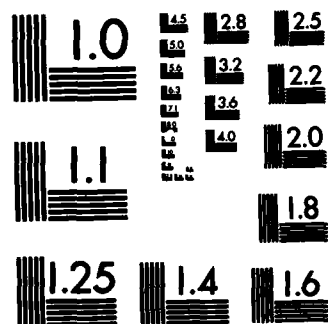
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**WOOD ANATOMY  
OF THE  
NEOTROPICAL SAPOTACEAE  
XXXVIII. MISCELLANEOUS**

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RESEARCH PAPER FPL 426

FOREST PRODUCTS LABORATORY  
FOREST SERVICE  
U.S. DEPARTMENT OF AGRICULTURE  
MADISON, WIS.

OCTOBER 1982

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### Abstract

Described here are three very distinctive specimens from eastern Brazil and a specimen from Amazonian Colombia alleged to be Piresodendron ucuqui (syn. Pouteria ucuqui). The Brazilian specimens are rather unique in that the pores are in clustered-echelon arrangement (resembling the woods of Bumelia (Group A) of the continental United States) and the occurrence of silica in the woods rays. The Colombian specimen of Piresodendron is poorly documented but because it may be the only extant wood specimen of this genus, an anatomical description has been provided for the record.

### Preface

The Sapotaceae form an important part of the ecosystem in the neotropics; for example, limited inventories made in the Amazon Basin indicate that this family makes up about 25 percent of the standing timber volume there. This would represent an astronomical volume of timber but at present only a very small fraction is being utilized. Obviously, better information would help utilization--especially if that information can result in clear identification of species.

The Sapotaceae represent a well-marked and natural family but the homogeneous nature of their floral characters makes generic identification extremely difficult. This in turn is responsible for the extensive synonymy. Unfortunately, species continue to be named on the basis of flowering or fruiting material alone and this continues to add to the already confused state of affairs.

This paper on Miscellaneous is the thirty-eighth in a series describing the anatomy of the secondary xylem of the neotropical Sapotaceae. The earlier papers, all by the same author and under the same general heading, include:

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| I. <u>Bumelia</u> --Res. Pap. FPL 325          | XX. <u>Manilkara</u> --Res. Pap. FPL 371                     |
| II. <u>Mastichodendron</u> --Res. Pap. FPL 326 | XXI. <u>Barylucuma</u> --Res. Pap. FPL 372                   |
| III. <u>Dipholis</u> --Res. Pap. FPL 327       | XXII. <u>Pradosia</u> --Res. Pap. FPL 373                    |
| IV. <u>Achrouteria</u> --Res. Pap. FPL 328     | XXIII. <u>Gayella</u> --Res. Pap. FPL 374                    |
| V. <u>Calocarpum</u> --Res. Pap. FPL 329       | XXIV. <u>Ecclinusa</u> --Res. Pap. FPL 395                   |
| VI. <u>Chloroluma</u> --Res. Pap. FPL 330      | XXV. <u>Ragala</u> --Res. Pap. FPL 396                       |
| VII. <u>Chrysophyllum</u> --Res. Pap. FPL 331  | XXVI. <u>Myrtiluma</u> --Res. Pap. FPL 397                   |
| VIII. <u>Diploon</u> --Res. Pap. FPL 349       | XXVII. <u>Sarcaulis</u> --Res. Pap. FPL 398                  |
| IX. <u>Pseudoxythece</u> --Res. Pap. FPL 350   | XXVIII. <u>Labatia</u> --Res. Pap. FPL 416                   |
| X. <u>Micropholis</u> --Res. Pap. FPL 351      | XXIX. <u>Eglerodendron</u> --Res. Pap. FPL 417               |
| XI. <u>Prieurella</u> --Res. Pap. FPL 352      | XXX. <u>Pseudocladia</u> --Res. Pap. FPL 418                 |
| XII. <u>Neoxythece</u> --Res. Pap. FPL 353     | XXXI. <u>Pouteria</u> --Res. Pap. FPL 419                    |
| XIII. <u>Podoluma</u> --Res. Pap. FPL 354      | XXXII. <u>Richardella</u> --Res. Pap. FPL 420                |
| XIV. <u>Elaeoluma</u> --Res. Pap. FPL 358      | XXXIII. <u>Englerella</u> --Res. Pap. FPL 421                |
| XV. <u>Sandwithiodoxa</u> --Res. Pap. FPL 359  | XXXIV. <u>Franchetella-Eremoluma</u> --<br>Res. Pap. FPL 422 |
| XVI. <u>Paralabatia</u> --Res. Pap. FPL 360    | XXXV. <u>Urbanella</u> --Res. Pap. FPL 423                   |
| XVII. <u>Gambeya</u> --Res. Pap. FPL 361       | XXXVI. <u>Syzygiopsis</u> --Res. Pap. FPL 424                |
| XVIII. <u>Gomphiluma</u> --Res. Pap. FPL 362   | XXXVII. <u>Genus Novo?</u> --Res. Pap. FPL 425               |
| XIX. <u>Chromolucuma</u> --Res. Pap. FPL 363   |  |

Publication in this manner will afford interested anatomists and taxonomists the time to make known their opinions and all such information is hereby solicited. At the termination of this series the data will be assembled into a comprehensive unit.

WOOD ANATOMY OF THE NEOTROPICAL SAPOTACEAE

XXXVIII. MISCELLANEOUS

By

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Forest Products Laboratory,<sup>2/</sup> Forest Service  
U.S. Department of Agriculture

Genus Novo?

Introduction

The three specimens included in this anatomical grouping are from the states of Eastern Brazil and for practical considerations are referred to here as Sapotaceae A. The specimens examined were Froes 1049 from Bahia, RBw 2955 collected by Mattos Filho in Espirito Santo, and RBw 2956 (Herbarium RB 87,951) designated as Pouteria butyrocarpa Kuhl and collected by Mattos Filho and A. Magnanini 26 in Espirito Santo.

Description

General: Wood light brown with a specific gravity of about 0.70, very fine textured; froth test negative.

Anatomical:

Pores in dense echelon-clusters (figs. 1,3,4) remindful of the Bumelia species native to the United States. Pores most commonly in radial multiples of 3-14 with maximum pore diameters of 87  $\mu$ m to 95  $\mu$ m; solitary pores few.

Vessel member length of the three specimens ranges from 610  $\mu$ m to 810  $\mu$ m with an average of 710  $\mu$ m. Intervessel pitting 4-5  $\mu$ m in Froes 1049; 4-6  $\mu$ m in RBw 2956; and 6-8  $\mu$ m in RBw 2955. Tyloses thin-walled. Perforation plates simple.

<sup>1/</sup> Pioneer Research Unit, Forest Products Laboratory.

<sup>2/</sup> Maintained at Madison, Wis., in cooperation with the University of Wisconsin.

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Axial parenchyma reticulate to diffuse. Cells occasionally with brown contents. Microcrystals present but rhombic crystals and silica not observed.

Wood rays 1-3 (4) seriate; heterocellular (fig. 2). Brown contents generally present. The maximum body height of the multiseriate portion of the wood rays ranges from 607  $\mu\text{m}$  to 910  $\mu\text{m}$ . Vessel-ray pitting irregular in shape and size but commonly obovoid to linear. Silica particles occur in all cell types; more or less spheroidal shape and attaining diameters of 12  $\mu\text{m}$  to 20  $\mu\text{m}$ ; embedded in the brown contents of the wood rays. Pitting on lateral walls of square and erect marginals fine and abundant. Rhombic and microcrystals not observed.

Wood fibers moderately thick-walled; average length of different specimens ranging from 1.49 mm to 1.97 mm. Vascular tracheids common.

Silica content of the three specimens ranged from 0.14 percent to 0.69 percent.

Diagnostic features: Easily recognized by its densely clustered pores in echelon arrangement and the presence of silica in the wood rays and microcrystals in the axial parenchyma. This is the only group of neotropical Sapotaceae with this combination of characters, and thus, easily recognizable.

Piresodendron ucuqui (Pires & Schultes) Aubr.

### Introduction

This species is described as a very large columnar tree known throughout the entire Brazilian parts of its range as "ucuqui", a word originating from the Indian language widely spoken in the State of Amazonas, and especially in the Rio Negro and its tributaries. In its known region of growth, which also includes Amazonian Colombia and Venezuela, the tree is familiar to the native Indians because of its fruit; when completely ripe it is palatable and resembles the avocado (Persea americana Mill.). Although this conspicuous tree has been well known for decades, the lack of flowering specimens prevented assigning this species to its proper genus. The first flowering material was collected early in 1948 and described (3)<sup>3/</sup> as a species of Pouteria. The flowers are five-merous and said to be immediately set apart from all other species of the genus by the extensively developed disk that surrounds the ovary.

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3/ Underlined numbers in parentheses refer to literature cited at the end of this report.

In 1963 Aubréville (1) made this species the type of his new genus Piresodendron, making the combination Piresodendron ucuqui (Pires & Schultes) Aubréville. In 1965 Baehni (2) transferred this species to Gymnoluma, making the new combination Gymnoluma ucuqui (Pires & Schultes) Baehni. Aubréville regards Gymnoluma as a synonym of Elaeoluma.

Whereas many herbarium specimens are available for this species, no wood specimens have been collected from the many trees that have been sampled. Yet the label on the herbarium sheet from the type tree states "Wood of medium hardness, compact, white." Apparently the only extant wood specimen is CTFTw 23262

(approximately 1 cm<sup>3</sup>) collected near Porto Leguizamo, between Rio Putumayo and Rio Caqueta (near the border of Caqueta and Amazonas, Colombia). The herbarium material itself consists of leaves collected at the base of the tree (Mariaux 1008) and additional specimens from the herbarium at Universidad de Bogota. Sterile herbarium specimens are always of doubtful identity but, because this species is well known to the native, it is tentatively accepted as valid.

The specimen available for this study was chopped from the bole of the tree and was very small. This was apparently to not damage the tree excessively because of its value to the natives. Given the special circumstances regarding this specimen, the following anatomical description must be regarded as tentative until larger and more adequate specimens become available for study.

#### Description

Pores in diffuse arrangement (fig. 6) with an observed maximum diameter of 110  $\mu$ m. Solitary pores present but mostly in radial multiples of 2-4 (5).

Vessel member length averages 600  $\mu$ m; intervessel pitting 3-4  $\mu$ m; perforations simple; tyloses not observed (apparently this sample is from the outermost sapwood).

Axial parenchyma banded (figs. 6,7) irregularly (1) 2-3 (4) seriate. Brown contents present in some cells and generally associated with spheroidal silica particles attaining diameters of 20  $\mu$ m. Microcrystals and rhombic crystals not observed.

Wood rays 1-3 seriate; heterocellular (fig. 8). Maximum body height of the multiseriate ray portion was 433  $\mu$ m. Vessel-ray pitting irregular in shape and size to obovoid and linear. Brown contents common. Silica particles abundant and attaining diameters of 20  $\mu$ m; specimen was too small to provide a chemical analysis. Rhombic crystals and microcrystals not observed in ray cells. Pitting on lateral walls of square and erect marginals fine and abundant.

Wood fibers moderately thick-walled; fiber length averages 1.24 mm. Vascular tracheids present.

Anatomically, this species would be separated from Pouteria by its very small intervessel pitting (3-4  $\mu$ m diameter). In Elaeoluma (Gymnoluma) the parenchyma is reticulate and the wood is brown with a very low specific gravity for the Sapotaceae. Superficially the wood resembles Diploon of southeastern Brazil but here the intervessel pitting is 6  $\mu$ m in diameter. Assuming that this specimen has been correctly identified, it may well belong to the monotypic Piresodendron as suggested by Aubréville.

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With this paper, the wood anatomy of the neotropical Sapotaceae has been concluded. Efforts have been initiated to take the already published data and that which has been derived from more recently acquired wood specimens and collate them into a unified publication. A key based on the wood structure is currently in preparation.



Literature Cited

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3. Pires, João Murça and Richard Evans Schultes.  
1950. The identity of ucuqui. *Harvard Univ. Mus. Leaflets* 14(4):87-96.

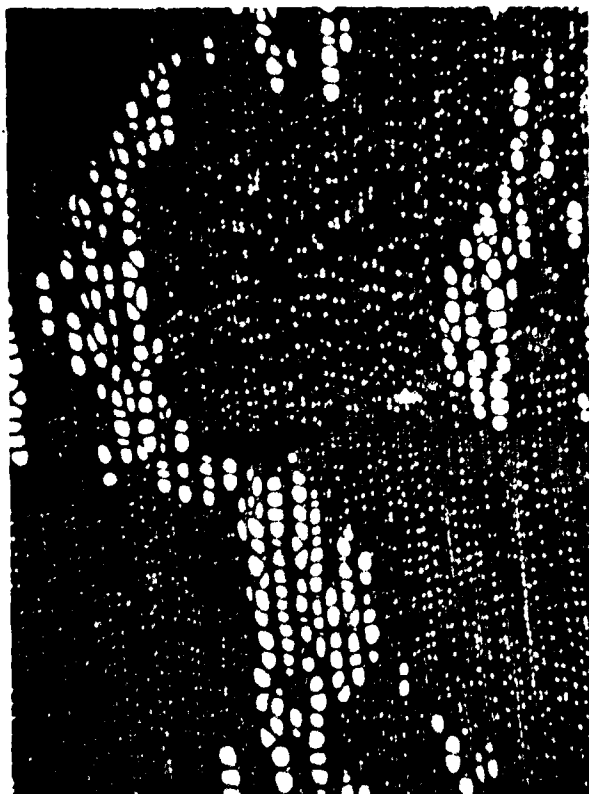


Figure 1.--Genus novo? Transverse section X 30 (Froes 1049).



Figure 2.--Same as figure 1, tangential section X 110.



Figure 3.--Same as figure 1, transverse section X 30 (RBw 2956 collected by Filho & Magnanini).



Figure 4.--Same as figure 1, transverse section X 30 (RBw 2955 collected by Mattos Filho s.n.).

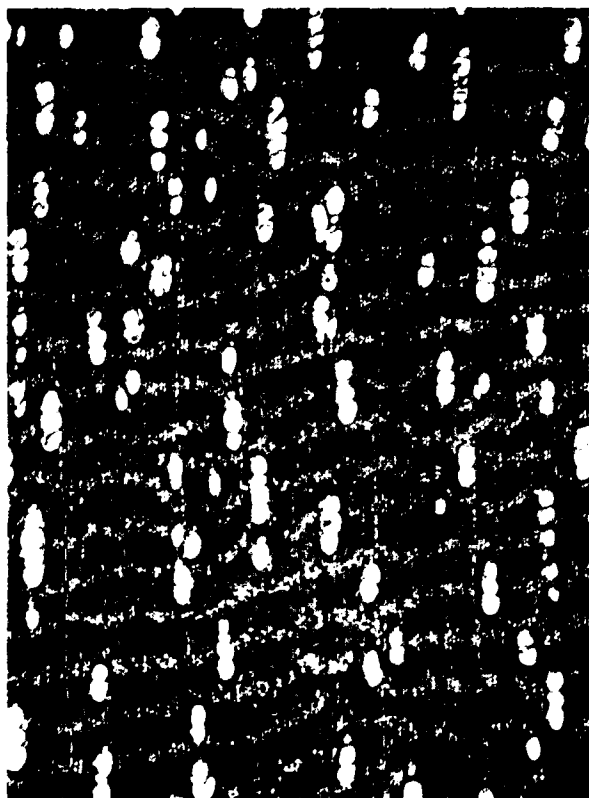


Figure 5.--Piresodendron ucuqui,  
transverse section X 30  
(Mariaux 1008).

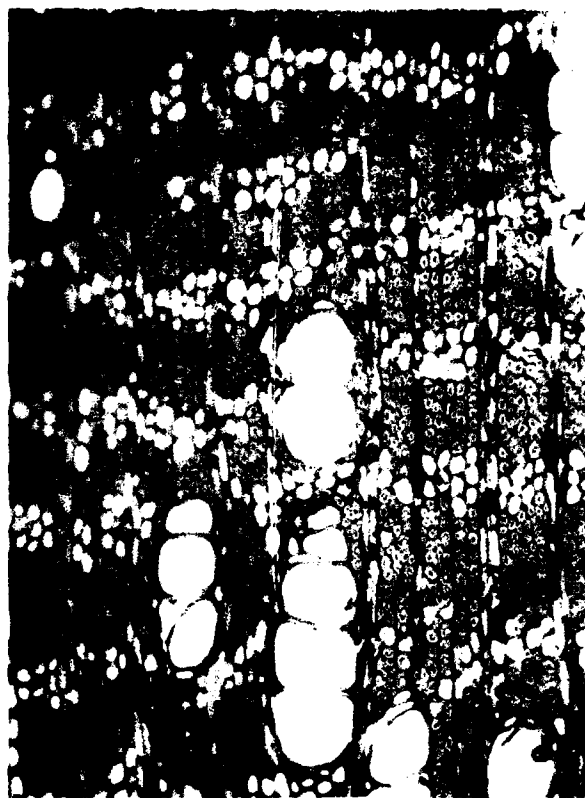


Figure 6.--Same as figure 5, transverse  
section showing parenchyma detail  
X 110.



Figure 7.--Same as figure 1, tangential  
section X 110.

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U.S. Forest Products Laboratory

Wood anatomy of the neotropical Sapotaceae: XXXVIII.  
Miscellaneous, by B. F. Kukachka, FPL.  
6 p. (USDA For. Serv. Res. Pap. FPL 426).

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